Statement of

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Mr. Chairman, Members of the Committee, I'm very pleased to be back before you to report on the work of the National Institute of Standards and Technology and to discuss our plans for the future.

Commerce and technology are perhaps the two greatest forces shaping the world we live in. Global commerce has linked us all in a complex, world-wide economic ecology, one that is

constantly reshaping itself to meet the rapidly accelerating pace of technological change. Leading economists estimate that technology accounts for at least 50 percent of the economic growth in this and other industrialized nations. I'd be hard pressed to think of a more exciting place to be in government today than at NIST, an agency that stands right at the intersection of commerce and technology.

Since becoming Director of NIST, I have outlined five principal challenges, goals, that I saw as crucial for NIST to meet as we enter the 21st century. This morning I'd like to briefly update you on our progress in meeting those goals and our plans for the next fiscal year.

Measurement and Standards Laboratories

First on the list was to ensure world leadership by NIST's Measurement and Standards Laboratories.

This is the sort of challenge that will always be important, and never will go away. The NIST laboratories are the ultimate U.S. reference point for measurements:

- Working with counterpart organizations throughout the world to provide industry and the scientific community with the equivalent of a common language needed at nearly every stage of a technical activity.

- Furthering the technical aims and capabilities of U.S. industry and serving as an impartial expert, developing highly leveraged measurement capabilities and other infrastructure technologies.

A couple of examples will underscore the breadth and importance of this work.

- NIST measurements are pervasive in the $350 billion electronics sector; the labs provide the microwave antenna measurements used by every major U.S. aerospace company and the national reference standards that support the accuracy of the electric power meters in every U.S. home and business. The measurement capabilities of the NIST laboratories provide the essential underlying support for the voluntary standards for the manufacture of U.S.-made optical fiber communications lines, an industry that competes in a $10 billion world market.

- In health care, among many other examples, the NIST labs provide national standards for the 11,000 U.S. mammography facilities and for exposure quality in the $10 billion U.S. photographic and X-ray film industry.

- In construction, NIST operates the foremost U.S. fire research laboratory and is the principal R&D agency working to reduce earthquake hazards through improved building codes and standards and practices for structures and lifeline.

- In the U.S. information technology sector, which adds $680 billion to the gross domestic product annually. The NIST labs develop test methods, computer science, and engineering methods that underpin metrology. They support economic growth through the Internet by developing test methods and security services for infrastructure, encryption, and data sharing.

I'm in no danger of running out of examples, and could go on at some length in this vein. Economic impact studies of NIST's laboratory programs show high rates of return and important benefits to industry.

A year ago I challenged the NIST staff to address directly:

- how well we were meeting the current and future measurement needs of industry and the country,

- how our performance compares with the best in the world, and

- what we need to do to be or remain at the top.

One result of this challenge was the "Best in the World" Staff Workshop series. Twelve workshops already have been held examining how specific NIST laboratory programs from time and frequency to fire-suppressant performance measure up against the best to be found anywhere in the world. We've identified potential opportunities for improvement, and are reviewing possible actions.

If this sounds to you like "benchmarking," by the way, it is. It is one example of how we have begun formally incorporating the Baldrige quality criteria in the management of NIST programs, another tool in our drive to ensure that we support U.S. industry and business with the best national standards program in the world.

And the NIST laboratories continue to produce world-class work. A few examples from this past year include:

- In a program conducted jointly with Sandia National Laboratories, NIST researchers are developing new measurement references for the semiconductor industry. Semiconductor manufacturers can now produce circuits with critical features too small to be reliably measured with existing technologies — features as fine as a tenth of a micrometer, about 500 times thinner than a human hair. With support from International SEMATECH and the Department of Energy, NIST and Sandia researchers have developed a first-in-the-world prototype measurement reference line 0.35 micrometers wide and are now working to apply the same concept to finer linewidths. The results will aid the electronics industry in monitoring the performance of microchip fabrication facilities.

- Working with the Center for Advanced Research in Biotechnology, NIST scientists recently helped determine the three-dimensional structure of an enzyme called threonine deaminase, a large biological molecule produced by the bacteria *E. coli*. The enzyme structure has long intrigued scientists as it has a switch on one end for turning itself on or off. Since the enzyme helps to produce an essential amino acid for *E. coli* bacteria, pharmaceutical researchers now can use its structure as a target for developing new antibiotic drugs. Because plants also use the enzyme, inhibiting it may offer a new strategy for weed control. Plastics manufacturers are interested in the enzyme because it produces a compound used to make biodegradable plastics. Modifications in the enzyme could improve efficiency in biodegradable plastic production.

- As you all are aware, businesses and governments world-wide are engaged in a race with time to uncover potential software errors that will be triggered by the so-called "Year 2000" or Y2K bug. This is not a trivial issue because in some cases hundreds of thousands or millions of lines of complex, often ill-documented code must be analyzed to determine if a problem even exists. These organizations now have a new tool in the form of NIST-developed algorithms that have been incorporated into commercial software designed to help find Y2K problems in programs written in the C language, one of the most popular languages for large, commercial and industrial programs. Programmers can use this software to figure out which of the lines of instruction — usually about 10 percent — need to be changed to conform to four-digit dates after the year 2000. NIST also established a year 2000 web site that provides businesses and individuals with information and software for assessing Y2K problems on their systems.

In addition to world-class work, another measure of the quality of the NIST laboratories is our world-class staff. This past year saw two particularly noteworthy honors:

- Physicists Eric A. Cornell of NIST and Carl E. Wieman of the University of Colorado at Boulder, both fellows of JILA, an interdisciplinary institute for research and graduate education in the physical sciences operated jointly by NIST and the university, were awarded the Lorentz Medal from the Royal Netherlands Academy of Arts and Science for their laboratory creation of the first Bose-Einstein condensate, a new form of matter predicted by Albert Einstein and Satyendra Bose more than 70 years ago. The medal, named in honor of Nobel Laureate Hendrik A. Lorentz, is awarded only every four years. Dr. Cornell and Dr. Wieman cooled rubidium atoms to about 170 billionths of a degree above absolute zero in a two-step process using laser and magnetic traps to create the unique condensate.

- NIST materials researcher John Cahn was named by President Clinton to receive the National Medal of Science, the nation's highest scientific honor. He was the only federal researcher to receive the medal in 1998. Dr. Cahn was honored as an original thinker who has applied fundamental scientific laws to the practice of solving down-to-earth problems, and whose contributions have influenced three generations of materials researchers, mathematicians, and

solid-state physicists. Dr. Cahn is perhaps most widely known for his co-discovery in 1984 of materials now classified as "quasicrystals", which brought about a revolution in the field of crystallography.

Plumbing and air-conditioning ducts are less romantic than new states of matter, but when an aging infrastructure starts interfering with our research, we can no longer ignore it. The great majority of our laboratory, office, and support buildings in Gaithersburg, Maryland, and Boulder, Colorado, are 30 to 45 years old and are deteriorating at an accelerating rate. NIST has designed a master facilities plan to guide the replacement, renovation, or repair of these buildings so that NIST can continue to provide U.S. industry and science with the best possible measurement system.

We reached a significant milestone last month with the completion of the new Advanced Chemical Sciences Laboratory. This $75 million laboratory provides state-of-the-art facilities for the most demanding measurements in today's chemistry and biotechnology research. The new ACSL will rank with the best such facilities in the world and give us a badly needed physical platform to meet industry's needs for precision chemical measurements in microelectronics, genetic engineering, pharmaceuticals, environmental technology, and many other areas.

The ACSL construction project came in on-time and on-budget, the type of project management you can expect from NIST.

Our budget request for FY 2000 includes three items to support the NIST laboratories in providing world-class services for the nation. They include an increase in our facilities budget to enable us to begin construction on badly needed laboratory facilities and new initiatives in critical infrastructure protection and science and math teacher training.

While it is a major step forward, completion of the ACSL by no means solves our infrastructure problems. Our budget request for facilities funding directly addresses these pressing needs:

- We are requesting $95 million to be combined with $108.3 million already appropriated in FY 1998 and FY 1999 to begin construction of the Advanced Measurement Laboratory (AML). The AML will provide stringent controls on particulate matter, temperature, vibration, and humidity that are unattainable in current NIST buildings. The AML will allow NIST to provide U.S. industry and science with higher quality NIST reference materials, improved measurements, and faster access to NIST research advances. These new NIST laboratory facilities will be equal to, or better than, similar laboratories overseas. Such conditions are vital for housing the institute's most advanced metrology, physics, chemistry, electronics, engineering, and materials science research and will enable NIST to keep pace with rapid developments in semiconductors, industrial robots, computers, pharmaceuticals, and emerging technologies requiring molecular and atomic-level precision. The AML will be a shared resource for NIST and the industrial and scientific communities that work closely with NIST.

- We also are requesting $12 million to undertake the highest priority safety, capacity, maintenance, and major repairs tasks to ensure compliance with various federal, state, and local health and safety regulations, to make modifications needed to improve access for people with disabilities, and to keep the existing buildings in reliable working order.

Our economy and armed forces have become ever more reliant on sophisticated information technology. As the world's strongest power the United States is a natural target of computer attacks, both by organized forces and malicious vandals. Successful attacks on key information and communications systems C or simple failures due to natural disasters or other events C could damage and undermine the nation's entire economy.

Most existing computer and communications systems are vulnerable. If safeguards are added, they can be expensive and C sometimes C of questionable effectiveness. Cost-effective technology, measurements, and test methods are needed to help avert catastrophic failures of critical infrastructures due to terrorism, war, or human error and to reduce the fraud, waste, and abuse perpetrated through low-level attacks on the computer and communications infrastructure.

The President has called for a national effort to improve the security of critical infrastructures, and the President's FY 2000 budget has made critical infrastructure protection a major priority. DOC is designated as lead agency for the information and communications sector. NIST also has a legislated mandate for computer security.

Our budget request for $3 million for Critical Infrastructure Protection will enable NIST to develop needed measurements, test methods, and standards to help ensure the reliability, trustworthiness, and survivability of information technology systems supporting critical national infrastructures.

This initiative focuses on efforts in security technology, system survivability, high-confidence systems, security for supervisory systems, and security for federal systems:

- NIST will collaborate with industry to accelerate the convergence of standards for public key infrastructure (which includes the mechanisms, procedures, and policies for the deployment of public key cryptography) and the deployment of related products and components.

- NIST will develop metrics and test methods and establish testbeds to enable comparisons of products that promote system survivability C both the ability to resist attack and to recover from disruption.

- Certain applications require ultra-dependability, such as air-traffic control or automated surgical and life-support systems in hospitals. If you combine two dependable systems, is the resulting hybrid also dependable? NIST will support the development of ultra-dependable

computing technology through new methods of testing and assurance and through new techniques for combining dependable components into integrated systems.

- Supervisory systems are used to control processing in major industrial applications. NIST will develop measurement techniques to apply advanced security to two specific types of supervisory systems. The work then will be applied to all supervisory systems.

- In addition, NIST will work with other government agencies and the private sector to identify resources and cost-effective strategies for information and help federal agencies implement information assurance best practices.

Education is, for NIST, not so much a standards issue as an infrastructure issue, and one of the most critical. Science and technology are mainstays of U.S. economic competitiveness.

Although education is, of course, not our primary mission, educational programs have a long tradition at NIST. This is not purely altruistic — the future quality of the Institute depends on a continuing supply of bright, well-trained, motivated scientists and engineers. When we inspire students to pursue careers in science and engineering, when we inspire graduate students to consider problems in measurement science, we invest in our own future as an institution.

NIST's educational programs touch every level of the education system. They include:

- our internationally known post-doctoral research program;

- our popular SURF — Summer Undergraduate Research Fellows — program, that gives undergraduates interested in careers in physics, materials science and engineering a 12-week honors program involving them in hands-on research;

- REAP — Resource Education Awareness Partnership — and AIS — Adventure in Science. These are volunteer programs that reach students from grade school through middle school with science-oriented demonstrations and special activities; and

- a variety of other efforts, including mentoring programs, support for science fairs, and special tours oriented towards school children.

Most of these programs are aimed at the student. But one very important way of improving science and math education is to enhance the training and development of science and math teachers, which we were authorized to do under PL 105-309.

In FY 2000 we are requesting $500,000 to begin a highly leveraged program to enhance the professional development of science and math teachers in the K-12 schools nationwide. Among

the approaches to be explored through this initiative, called the Teacher Science and Technology Enhancement Program are:

- support for professional enhancement of U.S. science and math teachers during the summer hiatus;

- model school-industry partnership programs linking schools with local high-tech firms to provide support and technology resources;
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- Internet-based services to create on-demand, net-based science and technology enrichment resources for teachers.

We have been discussing our initiative with state, local and national educational experts to obtain their suggestions and guidance. This past December we met with approximately two dozen of these experts, including representatives from National Council of Teachers of Mathematics, the California School system, professional science societies, and other federal agencies. We wanted to survey what works in teacher education enhancement and what gaps exist. We also have met with colleagues at the White House Office of Science and Technology Policy, National Science Foundation, U.S. Department of Education, U.S. Department of Labor, and the National School to Work Office to gain their advice and assistance to more clearly define the goals of the NIST program.

NIST staff have met with educational officials and experts in New York state, New Hampshire, Maine, and Kansas and we will be meeting with representatives of California and New Mexico for their suggestions on our implementation of this program.

Because the proposed funding is modest relative to the scope of the challenge, NIST will seek collaborations with other federal agencies, national education organizations, and the private sector for greatest leverage of federal funds.

International Standards

The second challenge I outlined was to ensure that measurement capabilities and standards are in place to support full U.S. participation in global markets.

This committee is well aware of the importance of trade to the U.S. economy. Exports account for a third of the growth of the economy. In 1997, total U.S. exports amounted to $960 billion, supporting one in five U.S. manufacturing jobs and accounting for 2 million new jobs in the past four years. Export-related firms create new jobs, increasing employment 20 percent faster than companies that do not export, are less likely to fail, pay higher wages (15 percent higher, on average) and generally provide better benefits. And yet, while world trade has been increasing by

15 percent annually, total U.S. exports have risen only 9 percent, and exports to the European Union are growing at less than 5 percent annually.

Why? In part this is because local or regional technical standards are adopted that serve as barriers to U.S. exports. Advancing local or regional technical standards as international standards to secure a trade advantage for one's own products is a well-recognized gambit, and some of our overseas competitors play the game far more aggressively than we do. The Federal Republic of Germany, for instance, has invested $40 million in metrology and standards projects in South America. They spend more in Brazil alone than NIST's entire budget for foreign metrology issues.

Of course we have to recognize the significant differences in our systems. In contrast to the centralized, federal standards system in Germany, for instance, the United States relies on ― and has been served well by ― a decentralized, voluntary, consensus-based system largely managed by the private sector. It is a system that has promoted innovation and technical excellence, but it is highly fragmented, making it difficult to contend with unified, well-organized challenges from abroad.

NIST has long experience in working with all elements of the complex U.S. standards community, with NIST scientists and engineers serving on and providing technical assistance to hundreds of individual standards bodies. We also work internationally to assure compatibility of our national measurement standards ― fundamental measures like the second and the meter ― with our international counterparts.

This past year we inaugurated a new and innovative service to advance and harmonize measurement capabilities throughout the Americas, furthering hemispheric goals of free trade and increased scientific cooperation.

SIMnet ― SIM for Sistema Interamericano de Metrologiá ― is an Internet-based, interactive system intended to support real-time comparisons of measurements performed at laboratories throughout the Americas. Launched last December for two years of pilot testing, SIMnet replaces complex and time-consuming "round robin" exchanges of equipment and personnel between nations with a network of personal computers, videoconferencing technology and software for data sharing and remote control of equipment. Over SIMnet metrology scientists can work collaboratively and remotely. Scientists in participating countries will be able to observe staff in another nation as they perform a measurement comparison. Remote observers will be able to share customized measurement software, review data as they are collected, ask questions, serve as consultants to the measurement institute performing the comparison, and even operate equipment located at their distant colleagues' laboratories.

SIMnet will help create a flexible, nimble and accurate measurement system shared throughout the Americas, a system essential to the envisioned Free Trade Area of the Americas. The pilot

SIMnet program will focus on electrical measurements needed for many products and processes. Countries participating in the pilot include Argentina, Brazil, Canada, Colombia, Costa Rica, Ecuador, Jamaica, Mexico, Panama, Trinidad and Tobago, Uruguay and the United States.

While SIMnet stands as a significant advance, much work remains to be done. Comparisons of U.S. national measurement standards with those of other nations are essential to ensure that American products are not rejected simply because of disagreements over the methods used to perform a measurement or test.

We are requesting $2 million in our FY 2000 budget for a coordinated effort to remove or avert technical barriers to trade by increasing worldwide recognition of U.S. measurements and standards and streamlining the domestic standards development process.

NIST has for years maintained a certain level of international intercomparisons in traditional measurement standards, such as physical, electrical, and radiometric measurements. But as new technologies emerge and national economies grow, the number and frequency of such comparisons are rising, requiring NIST to expand its activities in these areas. In addition, new technologies and industries are demanding the development of new and improved capabilities in fields such as information technology and biotechnology.

Chemical measurements have become increasingly important on the international scene. NIST, with its program of Standard Reference Materials, has long been the world leader in chemical measurements. But to meet current and anticipated demands we will have to expand our portfolio of SRMs and seek agreements with trading partners assuring mutual recognition of each partner's standards. Target areas will include important U.S. export sectors such as automobiles, fuels, pharmaceuticals, medical diagnostics, and food.

NIST also will develop capabilities to help U.S. industry meet the European Union's new requirements that products generate no harmful emissions and be immune to electromagnetic disturbances. Further, NIST will resolve and unify U.S. and international standards efforts for coordinate measuring machines, which are becoming common in automotive, aerospace, heavy equipment, and machine industries. These machines provide highly accurate dimensional measurements of mechanical parts with complex shapes.

As part of this initiative, NIST will help to increase U.S. participation in international standards development by providing $1 million to the American National Standards Institute (ANSI). ANSI is the official U.S. representative to the International Organization for Standardization and the International Electrotechnical Commission. An expanded infrastructure of technical measurements and standards coupled with ANSI's strong leadership and participation in the

international standards arena will support the growth of U.S. exports by reducing or eliminating technical barriers to trade.

Advanced Technology Program (ATP)

My third goal was to build greater consensus on the Advanced Technology Program's value.

As the ATP approaches its tenth year, we are massing more and more evidence of the program's effectiveness. The jury is in on the ATP — the program works.

The ATP has developed a comprehensive evaluation strategy that includes statistical profiling of projects, real-time monitoring of project developments, microeconomic case studies that detail outcomes over defined periods, and macroeconomic projections of long-term program and project impacts. I believe it to be one of the best developed, most thorough-going evaluation systems in government. And it is demonstrating results.

Already approximately 120 new technologies developed with ATP funding have been commercialized by industry. The ATP is successfully improving the capabilities of U.S. businesses to generate economic returns from scientific and technological innovations for the nation.

For example, the status reports on all ATP projects completed as of March 1997 show that technologies developed by 15 of the 38 completed projects have been incorporated into commercially available products or services, and that the economic benefits are expected to be broad in scope and large in magnitude.

According to a recent ATP study of more than 200 projects funded from 1993 through 1995, ATP is:

- generating high-risk, high-impact technologies. As intended, ATP projects go well beyond incremental advances on existing technologies. Seventy percent of the project companies reported a broader project scope and/or higher level of technical risk than could be supported by industry alone, 29 percent of the planned applications were expected to result in performance improvements of 100 to 500 percent or more, and 35 percent of the applications represent "new-to-the-world" solutions;

- fostering collaboration. Collaboration has helped 78 percent of organizations to achieve project goals (85 percent of those organizations reported that ATP was responsible to a great or moderate extent for the collaboration); and

- accelerating the development and commercialization of advanced technologies. Eighty-six percent of organizations said they would not have undertaken the project without the ATP or were significantly ahead in their R&D cycles as a result of ATP funding. (The only reason

that figure is not 100 percent is because the survey respondents included all joint-venture partners, including some companies working on only a part of the entire project.)

What sort of advances has come out of the ATP? They cover a broad range that reflects the diversity of companies, large and small, that have partnered in the program.

The ATP has gained some recognition as one of the early investors in the now burgeoning field of DNA analysis. The ATP provided critical early funding for the development of powerful new technologies that offer extraordinary advances in speed and convenience of DNA analysis. These technologies are rapidly advancing our capabilities to decode genes, manage diseases, discover new drugs, and cut costs in the trillion-dollar U.S. health-care industry.

The first of these systems are initial spin-offs of an ongoing ATP joint venture aimed at making low-cost, hand-held diagnostic devices for quickly analyzing DNA samples in doctors' offices. The devices will feature a combination of technologies developed by two small biotechnology firms in California. Affymetrix, Inc., adapted a photolithography manufacturing process to make postage stamp-sized DNA chips, which contain hundreds of thousands of gene sequences that detect matches in blood or tissue samples up to 100 times faster than conventional methods. Molecular Dynamics has introduced a system that sorts and sequences DNA in 96 tiny capillaries (tubes the size of a human hair) faster and more efficiently than traditional methods.

In electronics, researchers at Texas Instruments and NanoPore, Inc., a small New Mexico company, collaborated on an ATP project to create a practical, new insulating material to meet the requirements of the ultrafast integrated circuits of tomorrow. Entraining air, nature's ideal insulator, in microscopic glass bubbles they developed a novel insulator, xerogel, which was incorporated into an integrated circuit for the first time as part of an ATP project. As a follow up, the researchers combined a specific xerogel formula with a new technique for replacing conventional aluminum wires in integrated circuits with copper, a better conductor. The result: a new technology that could mean a 10-fold increase in microprocessor speed and vastly more powerful computers, cellular telephones, factory control systems, and other products. The innovation demonstrates a practical solution to a critical microelectronics problem: how to pack more circuits into smaller spaces without producing “cross talk”, the jumping of signals between unconnected wires.

In manufacturing, the ATP supported major project involving a broad coalition of large and small companies under the National Center for Manufacturing Sciences to developed a suite of advanced technologies for machine-tool spindles ― the part that holds the cutting tool on a rotating shaft. Don't be fooled by the apparently low-tech nature of a spindle. The multidisciplinary team assembled for this project developed a suite of innovations with literally "revolutionary" impact. The new design has the potential to save as much as $6 million annually in the production of a single part. It's unique bearing design won an R&D 100 award for technological innovation.

In the spirit of constant improvement, we continue to examine the ATP for opportunities to maximize our resources, and produce the maximum impact. This year, for example, we are experimenting with a new structure for our project competition that draws on the best features of the general and focused-program competitions we have used in previous years.

With results like those I have mentioned and stable funding for the ATP, I believe we can count on broad and strong industry support for the ATP, even though participating in the program requires industry to commit significant resources to the broadly enabling technologies the ATP fosters. We saw a demonstration of this last November when the ATP held its first large-scale national meeting in Atlanta to discuss program plans and explore technology roadmaps with industry. The meeting threatened to become something of an embarrassment only because the industry turnout was far heavier than our most optimistic dreams, and many sessions were standing-room-only.

Our FY 2000 request for $239 million for the ATP will enable us to continue multi year projects selected in previous years; conduct a new competition open to all areas of technology; and continue to implement a multifaceted economic evaluation program that includes statistical profiling, microeconomic case studies, and macroeconomic projections of long-term project and program impacts. The request, when combined with anticipated carryover and prior year recoveries, will permit approximately $73 million for new awards.

Manufacturing Extension Partnership (MEP)

The challenge for the Manufacturing Extension Partnership was to continue expanding access to services for more small and medium-sized companies and to receive authorization to continue federal support for MEP centers after the sixth year.

We were successful in receiving the latter authorization, and the MEP has continued to expand its client base. More than 2,000 manufacturing specialists and professional staff now provide services through more than 400 MEP-affiliated centers and offices across the country, reaching approximately 26,000 small- and medium-sized enterprises in 1998, a nearly 20 percent increase over the previous year.

As you know, the MEP provides small and medium-sized manufacturers with access to technologies, resources, and expertise specifically tailored to their needs. Working through state and local governments and local extension service providers, MEP centers can design programs based on the unique needs of local businesses.

Key to this effort is keeping abreast of the client’s needs. As part of the Small Business Working Group of the President's Council on Year 2000 Conversion, for example, the MEP, working extensively and in close coordination with all the MEP Centers, is now offering seminars and a

computer-based tool to help small businesses better understand and deal with the year 2000 date problem.

The tool — called Conversion 2000: Y2K Self-Help Tool — is helping small manufacturers and others conduct an inventory of equipment, including hardware, software and embedded systems; identify core business systems and rate their importance to the survival of the business; develop contingency plans; and plan and manage remediation projects. MEP's web site also features resources, tools, and references aimed at helping smaller companies combat the year 2000 computer problem, and NIST recently established a Y2K Help Center Hotline which provides technical support for users of the Y2K Self-Help Tool. (1-800-Y2K-7557)

With the $21 million increase in funding awarded to MEP in the Fiscal Year 1999 Emergency Supplemental Appropriations, MEP is able to work with even more smaller manufacturers and provide much needed Y2K assistance through a combination of adding additional field staff and consulting resources. In addition, to further reach small businesses MEP is working in collaboration with the Small Business Administration and the Department of Agriculture to develop seminars and workshops to train field staff personnel to address Y2K to increase outreach to their respective client base as well. Support will include additional training on the Conversion 2000: MEP Y2K Self-Help Tool kit, a CD-ROM self assessment tool that helps organizations to evaluate their exposure to the Y2K problem and devise contingency and remediation plans.

We also provide a MEP Web Site Resource Support for companies using the Self-Help Tool to implement a Y2K project. This partnership also has set up a Y2K Help Center for Small Business, which is staffed by skilled analysts trained to assist small businesses with their Y2K project questions. More information on the Y2K assessment tools or how to help smaller manufacturers and businesses in your area please can be obtained at the Y2K hotline at 1-800-Y2K-7557 or through the web site at http://y2khelp.nist.gov.

The Department of Commerce has decided to take the CD-ROM-based self assessment tool international and is translating the tool and accompanying material, such as the users manual, into seven foreign languages. DOC is distributing the CD-ROM through U.S. embassies around the world, and through a series of Y2K conferences which DOC is planning in 14 countries.

To optimize center performance and further increase the competitiveness of smaller manufacturers, two efforts were initiated recently:

- the Baldrige National Quality Program evaluation criteria have been adopted as a framework for generating continuous improvement in MEP-funded center performance and impact

- an integrated knowledge management system is being developed to facilitate the sharing of

best business practices among the centers.

Our FY 2000 budget request of $100 million for the MEP includes an initiative of $1 million in new funding to gather, promote, and effectively deploy to all MEP manufacturing extension centers the highest priority best practices in areas such as employee development and service delivery, both to enhance center quality and effectiveness and to introduce new services quickly to help small and medium-sized businesses compete in global markets. Currently, MEP is able to provide only very limited best practice information to centers. Funding under this initiative will enable MEP to accelerate its efforts to meet center demands for best practices information in the areas of center operations, center business practices, and service delivery.

The FY 2000 budget request also proposes a decrease of $9.1 million in MEP funding. This decrease reflects a lower federal share of the centers' operating costs since the federal share changes as the centers mature. In the first three years, the federal share is 50 percent; in year four, 40 percent. In years five and six and for renewals, the federal share is one-third. The number of centers will not change as a result.

Baldrige National Quality Program

The final challenge was to promote performance excellence in health care and education, particularly among non-profit organizations, through the Baldrige National Quality Program.

I'm pleased to report that we are well on the way to achieving this goal. We received authority to make Baldrige awards in both the education and health-care sectors, which join the existing Baldrige categories for manufacturing, service, and small business this year for the first time. The new Baldrige Criteria for Performance Excellence in health care and education, the products of many months of research and testing with those communities, have just been released.

We're very excited about this. Since its establishment, the National Quality Program has been recognized as a focal point for strengthening America's competitive position. The program helps many types of companies and organizations deliver ever improving value to customers while improving overall organizational effectiveness. It creates a performance excellence standard that fosters communications and sharing in the private sector, building networks to deliver performance and quality management information and services and to share lessons learned with other economic sectors. Extending this influence to two of the sectors that most profoundly affect our day-to-day lives promises significant benefits for our economy and our society.

The Baldrige National Quality Program has proven to be highly effective in stimulating interest in performance improvement, excellence, sharing and cooperation, and the creation of new information networks within the business and public sectors. Collectively, Baldrige Award recipients, examiners, and NIST staff have given more than 50,000 presentations at conferences worldwide. With a relatively small annual federal investment, the Baldrige program leverages

over $100 million in-kind contributions from the private sector and state and local governments.

And the market has demonstrated that quality translates to productivity and profit. The "Baldrige Index," a fictitious stock fund made up of publicly traded U.S. companies that have received the Malcolm Baldrige National Quality Award between 1990 and 1997, continues to outpace the S&P 500, currently by about 250 percent.

Extending the Baldrige program to health care and education is a development which has received strong support from those communities ─ and especially from the business sector. The private-sector Foundation for the Malcolm Baldrige National Quality Award has committed to raise $15 million to endow the health care and education awards.

The FY 2000 appropriations of just over $5 million will be used to manage the annual award competition, conduct a conference at which Baldrige award winners share their performance excellence strategies, maintain a comprehensive database on state and local quality awards, continually improve the performance excellence criteria that serve as the national standard, and facilitate information sharing among all sectors of the U.S. economy.

A year ago I proposed five goals for NIST to pursue as we enter our next century of service to U.S. industry and commerce. In the intervening months we have made strong progress in meeting all of those marks, but ─ as usual ─ challenges remain.

- We must continue to modernize and strengthen our laboratory facilities, to ensure that NIST's scientist and engineers have the resources they need to meet industry's demands for excellence in standards and measurements.

- We must continue to work closely with the U.S. industrial standards communities and the international standards community ─ in the face of ever-growing international competition ─ to lower barriers to U.S. exports.

- We must aggressively press the proven Advanced Technology Program strategy, accelerating the development of broadly enabling technologies for the U.S. through cost-sharing in high-risk R&D projects.

- We must continue to promote quality business practices for improved performance and productivity nationally through the Baldrige National Quality Program and the Manufacturing Extension Partnership, and, as importantly, continue to improve the quality and efficiency with which we deliver those services.

- Perhaps the greatest challenge: we must do this within the necessary constraints of the tight budgets dictated by national priorities and fiscal prudence.

This year's budget, Mr. Chairman, represents a good balance between fiscal restraint and the key

initiatives that will allow NIST to meet the needs of technology and commerce as we enter the next century. Mr. Chairman I would now like to turn to a discussion of issues related to the Fastener Quality Act (FQA).

I will briefly describe the study on the FQA conducted by the Department of Commerce, our findings, and our recommendations.

Public Law 105-234 was signed by President Clinton on August 14, 1998. The law delayed implementation of the FQA until the later of June 1, 1999 or 120 days after the Department of Commerce submits a report to Congress on the FQA. The law directed that in the report the Department recommend changes in the Act that may be warranted based on changes in fastener manufacturing technology and the existence of other regulatory programs covering fasteners. The Department also considered (1) whether fastener problems may represent a current threat to public safety, (2) whether imported fasteners pose the same threat as they were perceived to 10 years ago, (3) how the military and other federal agencies have improved their procurement practices since 1990, and (4) concerns expressed by industry about the Act as written.

The Department published a Federal Register notice on October 7, 1998, requesting information from the public on all relevant issues. More than 600 pages of comments were received from 137 individuals and organizations.

The American Society of Mechanical Engineers (ASME) conducted a three-day workshop for the Department, November 9-11, 1998, in Chicago, Illinois, to document how fastener manufacturing technology has changed since 1990. Representatives from 63 industrial companies from the United States, Canada, and Europe, as well as 7 government agencies and 9 non-profit universities and associations attended the workshop.

Staff of the Defense Industrial Supply Center (DISC), the National Highway Traffic Safety Administration (NHTSA), the Federal Aviation Administration (FAA), and the National Aeronautics and Space Administration (NASA) supplied substantial information directly to the Department on either documented problems related to fasteners in programs that regulate public safety or improvements in fastener procurement practices made over the past decade.

In analyzing all available information, the Department concluded there have been a number of positive changes in the fastener industry since the FQA was passed. There are occasional problems but the number and magnitude of problems uncovered in this five-month study appear to be relatively small compared to a decade ago. In addition, there have been significant improvements in military and federal procurement of fasteners and significant advances in fastener manufacturing technology. I will cite a few examples from the DOC report, copies of which have been provided to the committee.

In analyzing 41,000 entries of airplane accidents and incidents in the National Transportation Safety Board's database dating back to 1983, less than 1% could be attributed to fasteners and

most of those appear to have been caused by problems other than fastener quality.

On the other hand, we found a mid-1990s report of a Norwegian commercial aircraft that crashed killing 55 people when its vertical stabilizer and attached rudder broke from the fuselage. A three-year investigation conducted by Norwegian authorities found that the bolts holding the stabilizer were only 50% of their specified hardness.

The U.S. Customs Service has been conducting spot checks of imported fasteners since 1991 to determine if the fasteners meet the specifications for the grade indicated. From 1991 through 1997, all spot checks have indicated no more than 1% fastener failures that Customs attributes to poor quality control by the manufacturers. However, they currently have an open investigation on a 5% nonconformance rate discovered in the January-April 1998, spot check.

During the period from just prior to enactment of the FQA through today, the automobile industry has been subject to fewer than 20 recalls where fastener quality was the problem. The percentage of all recalls involving fastener quality has been less than 1%. Very few accidents occurred in conjunction with these recalls and there were no fatalities for all the vehicles involved.

The fastener procurement practices of the Defense Industrial Supply Center (DISC) was a major focus of investigation during the 1980s leading up to the passage of the FQA. During the 1990s, DISC has instituted major new procurement practices including a Listing of Fastener Manufacturers Identification Symbols, 100% testing of lots of "flight safety critical fasteners," and the use of a Qualified Suppliers List Program for both fastener manufacturers and distributors. DISC has checked military inventories over the past four years and found no evidence of widespread problems with substandard or mismarked fasteners. Any instances of misconduct by fastener suppliers are quickly addressed.

The Department concludes that there have been a number of positive changes in the fastener industry since the FQA was passed. The number and magnitude of problems uncovered in this five-month study appear to be small compared to a decade ago. In addition, there have been significant improvements in military and federal procurement of fasteners and significant advances in fastener manufacturing technology. If Congress determines that it is appropriate to continue to regulate fasteners, the Department recommends Congress amend the Act as follows to limit its application to fasteners where public safety may remain a problem.

The Department recommends that coverage under the Act be limited to only high strength fasteners manufactured to consensus or government standards that require a grade mark. By this we mean fasteners having a minimum tensile strength of 120,000 psi, the level above which grade markings on fasteners are normally required. We recommend exclusion of fasteners whose specification merely reference consensus or government standards. For the most part, they are made for major end users like the automobile industry who are able to ensure they receive precisely the part they seek.

Additional recommendations include:

1. Encouraging the use of quality management systems like QS 9000 in fastener manufacturing by deeming fasteners from a facility registered to such a system to be FQA compliant,
2. Allowing required reports and certificates to be transmitted and stored electronically, and
3. Amending Title 18 of the United States Code to specifically address fraud in public and private commercial transactions involving fasteners.

In conclusion, the Department has completed the required study of the Fastener Quality Act. We are prepared to assist you in further deliberations on the future of the FQA if you so request. Thank you for your time and I would be happy to answer any questions.